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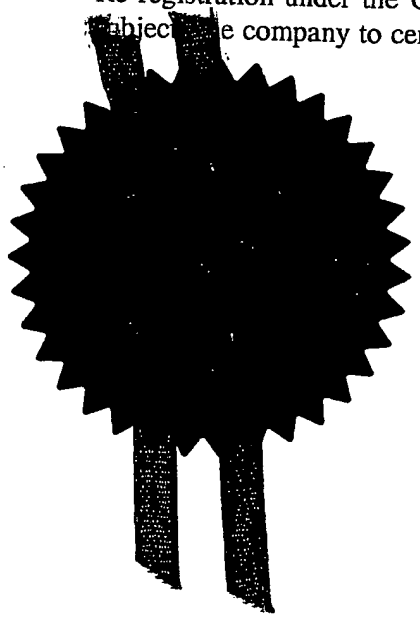

Signed Stephen Hordley

Dated 15 November 2004

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Patents Form 1/77

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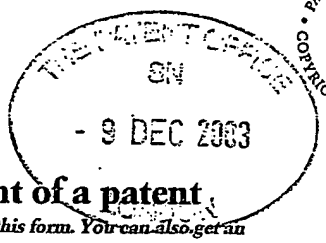

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference — PPD 70337/GB

2. Patent application number *(The Patent Office will fill in this part)* — 09 DEC 2003 — 0328530.1

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

SYNGENTA Limited
European Regional Centre
Priestley Road
Surrey Research Park, Guildford,
Surrey, GU2 7YH, United Kingdom

Patents ADP number *(if you know it)* — 6254007002 — 08330748001

If the applicant is a corporate body, give the country/state of its incorporation — UNITED KINGDOM

4. Title of the invention — AGROCHEMICAL COMPOSITION

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Michael James RICKS
Intellectual Property Department
Syngenta Limited
Jealott's Hill International Research Centre
PO Box 3538
Bracknell, Berkshire, RG42 6YA
UNITED KINGDOM

Patents ADP number *(if you know it)* — 08029563001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

YES

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	05
Claim(s)	02
Abstract	00
Drawing(s)	00

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature Syngenta Limited C. Dowling Authorised Signatory Date 8th Dec 20

12. Name and daytime telephone number of person to contact in the United Kingdom

Clare DOWLING = 01344 414834

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Notes

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b) *Write your answers in capital letters using black ink or you may type them.*

c) *If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.*

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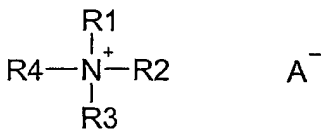
AGROCHEMICAL COMPOSITION

The present invention relates to an agrochemical composition and in particular to an aqueous composition comprising an agrochemical active ingredient and an adjuvant.

Agrochemical active ingredients are generally utilised in combination with an adjuvant, which is frequently a surfactant. Most commonly adjuvants are added to enhance the bioperformance of the active ingredient and many such bioperformance enhancing adjuvants are known to those skilled in the art. We have now found that certain amines provide effective bioperformance enhancement of the active ingredient despite having little or no surfactant properties.

According to the present invention there is provided a method of improving the activity of an agrochemical which comprises incorporating an amine of formula (I) or a salt thereof in a composition comprising the agrochemical

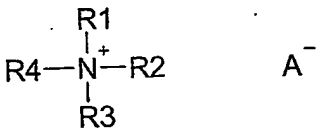


(I)

wherein R^1, R^2, R^3 and R^4 (which may be the same or different) are C_2 to C_4 alkyl
or R^1 is hydrogen and R_2, R_3 and R_4 (which may be the same or different) are C_2 to C_4 alkyl
or R^1 and R^2 are hydrogen and R^3 and R^4 (which may be the same or different) are C_2 to C_4 alkyl
and A^- is an agrochemically acceptable anion.

As specific amines suitable for use in the present invention there may be mentioned diethylamine or a salt thereof, triethylamine or a salt therof, a tetraethylammonium salt, a tetrapropylammonium salt and a tetrabutylammonium salt. It is preferred however that the amine of the present invention is not a triethylamine salt or a tetraethylammonium salt

Thus according to a further aspect of the present invention there is provided an agrochemical composition comprising an agrochemical active ingredient and a amine of formula (1)



(I)

wherein R^1, R^2, R^3 and R^4 (which may be the same or different) are C_2 to C_4 alkyl or R^1 is hydrogen and R_2, R_3 and R_4 (which may be the same or different) are C_2 to C_4 alkyl

or R^1 and R^2 are hydrogen and R^3 and R^4 (which may be the same or different) are C_2 to C_4 alkyl

and A^- is an agrochemically acceptable anion

provided that R^1, R^2, R^3 and R^4 are not all ethyl and that when R^1 is hydrogen R_2, R_3 and R_4 are not all ethyl.

The amines of the present invention are basic compounds and if used in its basic form may be incompatible with base-sensitive agrochemicals such as paraquat as well as being a potential hazard to human exposure. It is preferred therefore that in normal use and in particular when used with base-sensitive agrochemicals, the amines of the present invention are neutralised in whole or part. The amines of the present invention may conveniently be neutralised by the addition of acid, for example a mineral acid such as a halide acid, for example hydrochloric acid or an organic acid such as acetic acid. The amines of the present invention may also however be neutralised by the addition of any suitable anionic acid species, including anionic surfactants as will be described in greater detail below. The term "a salt of the amines of the present invention" as used herein includes the amines of the present invention whether wholly or partially neutralised by an anionic species (A^-) and does not necessarily imply the physical association of the amine cation and the anionic species in the composition. It will generally be convenient to neutralise or partially neutralise the amines of the present invention prior to incorporation in the composition of the invention.

The term agrochemical as used herein includes without limitation herbicides, insecticides, fungicides, plant growth regulators and seed treatment agents. It is preferred that the agrochemical composition is an aqueous composition and it is especially preferred that the agrochemical is a water-soluble agrochemical. The aqueous agrochemical composition will generally be applied to the target by spraying and the composition may be a concentrate which is designed to be diluted with water

prior to application or may be ready for application. Specifically, the amines of the present invention or a salt thereof may be incorporated into the spray composition prior to application as a tank mix or may form a component of an agrochemical concentrate intended for dilution prior to use. It is a particular advantage of the salts of amines of the present invention they are readily soluble in water and are generally compatible with water-soluble agrochemicals. Salts of amines of the present invention are thus particularly suitable to be "built-in" to a concentrate comprising a water-soluble active ingredient.

Suitable agrochemical active ingredients are known to those skilled in the art and are listed in standard reference works such the Pesticide Manual. As examples of suitable water-soluble active ingredients there may be mentioned paraquat, diquat, glyphosate, fomesafen, thiamethoxam, mesotrione, and trifloxysulfuron. By the term "water-soluble" agrochemical is meant an agrochemical having a solubility in water of at least 1 g/l and preferably at least 4 g/l, for example at least 100g/l. Of course many agrochemicals have a much higher solubility, for example 300 g/l or more or up to 500 or 600 g/l or more. Paraquat and diquat are particularly suitable agrochemical active ingredients

Thus according to a further aspect of the present invention there is provided an aqueous agrochemical composition comprising paraquat or diquat and a salt of an amine of formula (I) provided that R^1, R^2, R^3 and R^4 are not all ethyl and that when R^1 is hydrogen and R_2, R_3 and R_4 are not all ethyl.

According to a still further aspect of the present invention there is provided an aqueous agrochemical concentrate composition comprising paraquat or diquat and a salt of an amine for formula (I) provided that R^1, R^2, R^3 and R^4 are not all ethyl and that when R^1 is hydrogen and R_2, R_3 and R_4 are not all ethyl and wherein the concentration of the paraquat or diquat is greater than 100 g/l.

Typically the pH of the paraquat or diquat composition of the invention will be from 3.0 to 8.0 and preferably from 4.0 to 8.0. In general the pH of the amine is adjusted with acid approximately to that of the paraquat or diquat composition and those nitrogen atoms of the amine which are sufficiently basic become protonated.

The amines of the present invention when used as sole adjuvant may provide effective bioperformance enhancement. There may be advantages however in using the amines of the present invention in combination with a second adjuvant. The

second adjuvant is preferably a surfactant. There is no particular limitation on the surfactant that may be used and numerous examples will occur to those skilled in the art. We have found that anionic, cationic, non-ionic or amphoteric surfactants may be effective.

As noted above the amines of the present invention may form a salt with an anionic surfactant or a surfactant having an acidic form. If desired, such a salt may be pre-formed by the reaction of the amines of the present invention with the anionic surfactant, for example in aqueous solution, but there is no particular need for such pre-reaction.

The ratio by weight of the amines of the present invention to the surfactant may vary within wide limits, for example from 50:1 to 1:50, and in particular from 10:1 to 1:1 by weight. In some instances a small proportion of the amines of the present invention may have a surprisingly large effect in enhancing the bioefficacy of conventional surfactants. Thus for example a ratio of the amines of the present invention to the surfactant of from 1:1 down to 1:25 by weight, for example from about 1:4 to 1:15 may show significant enhancement of the bioefficacy of the surfactant.

The ratio by weight of the amines of the present invention to the agrochemical active ingredient is preferably from 1:10 to 10:1, for example from 1:4 to 1:1. When the amines of the present invention are used in combination with one or more additional adjuvants, for example additional surfactants, the ratio by weight of the total adjuvant (amine of the present invention plus additional surfactants) is preferably from 1:10 to 10:1, for example from 1:4 to 1:1. The composition may contain further additives conventional in the art.

The invention is illustrated by the following Examples in which all parts and percentages are by weight unless otherwise stated.

EXAMPLE 1

The bioperformance enhancement of paraquat in the presence of amines of the present invention was evaluated. The amines were tested and the results are presented in Table 1. An aqueous formulation of paraquat dichloride containing 0.5% by weight of the amine (based on the weight of the salt of the amine and based on total spray volume) was applied using a moving track sprayer to eight representative weed

species at 10, 20 and 40 g /ha (based on paraquat ion). The spray volume was equivalent to 200 l/ha.

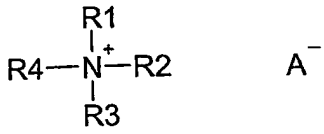
Three replicates of each test were undertaken and the biological data (% activity where 0% represents no herbicidal effect and 100% represents complete kill) at 7 days after treatment is expressed in Table 1 as a mean over all species based on an average response over the combined rates. The results are compared with an equivalent formulation containing only paraquat chloride.

Table 1

Amine of the Present Invention	Mean Activity (%)
None	54
Diethylamine as the hydrochloride salt	66
Triethylamine as the hydrochloride salt	67
Tetraethylammonium hydrochloride	69
Tetrapropylammonium hydrobromide	67
Tetrabutylammonium hydrobromide	72

CLAIMS

1. A method of improving the activity of an agrochemical which comprises incorporating an amine of formula (I) or a salt thereof in a composition comprising the agrochemical



(I)

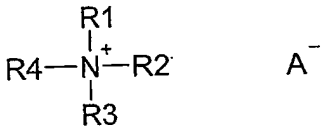
wherein R^1, R^2, R^3 and R^4 (which may be the same or different) are C_2 to C_4 alkyl

or R^1 is hydrogen and R_2, R_3 and R_4 (which may be the same or different) are C_2 to C_4 alkyl

or R^1 and R^2 are hydrogen and R^3 and R^4 (which may be the same or different) are C_2 to C_4 alkyl

and A^- is an agrochemically acceptable anion.

2. An agrochemical composition comprising an agrochemical active ingredient and a amine of formula (I)



(I)

wherein R^1, R^2, R^3 and R^4 (which may be the same or different) are C_2 to C_4 alkyl

or R^1 is hydrogen and R_2, R_3 and R_4 (which may be the same or different) are C_2 to C_4 alkyl

or R^1 and R^2 are hydrogen and R^3 and R^4 (which may be the same or different) are C_2 to C_4 alkyl

and A^- is an agrochemically acceptable anion

provided that R^1, R^2, R^3 and R^4 are not all ethyl and that when R^1 is hydrogen R_2, R_3 and R_4 are not all ethyl.

3. An aqueous agrochemical composition comprising paraquat or diquat and a salt of an amine of formula (I) provided that R^1, R^2, R^3 and R^4 are not all ethyl and that when R^1 is hydrogen and R_2, R_3 and R_4 are not all ethyl.

4. An aqueous agrochemical concentrate composition comprising paraquat or diquat and a salt of an amine for formula (I) provided that R^1, R^2, R^3 and R^4

are not all ethyl and that when R^1 is hydrogen and R_2, R_3 and R_4 are not all ethyl and wherein the concentration of the paraquat or diquat is greater than 100 g/l.